

# APPLICATION FOR UNITED STATES PATENT

**in the name of**

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for

# **RECESSED BOTTLE STORAGE**

# RECESSED BOTTLE STORAGE

## BACKGROUND

This application relates to the recessed storage of wine bottles and other bottles.

The generally accepted manner for storing wines is to rest a wine bottle on its side so the cork stays in contact with wine. Although storing a bottle on its side occupies more space, it also prevents the cork from drying out and air from entering the bottle. With sparkling wines, a dried out cork permits gas to escape, resulting in a "flat" wine. Moreover, ideally, wine should be stored in a cool, dark place having a fairly constant temperature of about 55° to 60° F.

Wine is thus often stored in a wine cellar where large amounts of space are devoted to the storage of wine and temperature is maintained relatively cool. However, many people do not have a cellar or large amounts of space to devote to the storage of wine. Moreover, even those individuals with a wine cellar often store a few wine bottles in the kitchen or other room above the cellar, since the wine is then on hand and easily accessed.

There are a number of wine and spirit racks that are available for the storage of bottles outside of a cellar. However, these wine and spirit racks occupy a portion of the floor or countertop that would otherwise be available for other uses.

## SUMMARY

The recessed storage of wine bottle and other bottles removes at least a portion of the rack and the bottle from the room where the bottle is stored. This reduces the amount of space required for the storage of bottles, and bottles, especially wines, may be efficiently and properly stored in rooms that are easily accessible or in homes that do not have a cellar.

The details of one or more implementations are set forth in the accompanying drawings and the description below. Other features, objects, and advantages will be apparent from the description and drawings, and from the claims.

## DESCRIPTION OF DRAWINGS

FIG. 1 is a diagrammatic view of a bottle rack in a partially cutaway wall;

FIG. 2 is a sectional view taken along the line 2-2 of the bottle rack in FIG. 1;

FIG. 3 is a diagrammatic view of another implementation of a bottle rack in a partially cutaway wall;

FIG. 4 is a sectional view taken along the line 4-4 of the bottle rack in FIG. 3;

FIG. 5 is a diagrammatic view of a bottle cradle;

5 FIG. 6 is a diagrammatic view of another implementation of a bottle rack in a partially cutaway wall;

FIG. 7 is a front view of another implementation of a bottle rack in a partially cutaway wall;

10 FIG. 8 is layered cutaway view of the bottle rack of FIG. 7;

FIG. 9 is a sectional view taken along the line 9-9 of the bottle rack of FIG. 7; and

FIG. 10 is a sectional view taken along the line 10-10 of the bottle rack of FIG. 7.

### DETAILED DESCRIPTION

Referring to FIG. 1, a bottle rack 100 is mountable recessed in a wall for the space-saving storage of bottles 10. Bottle rack 100 includes a housing 110 that houses three bottle cradles 120. Housing 110 is of unitary construction and includes a rear wall 112, a top wall 114, a bottom wall 115, and opposing side walls 116, 117 to define a forwardly open interior chamber 105. The front circumference of housing 110 is surrounded by a lip 150. Bottle cradles 120 extend laterally from side wall 116 to side wall 117 inside housing 110 and are formed by two substantially parallel rods 121, 122 adjacently mounted to side walls 116, 117.

20 Side walls 116, 117 each define a series of fastener holes 118 dimensioned to receive fastening screws 119 for mounting bottle rack 100. Cradles 120 cradle bottles 10 to maintain the corks or other stoppers of bottles 10 in contact with a stored liquid, for example, with a stored wine.

Referring also to FIG. 2, in use, bottle rack 100 is mounted partially recessed inside a wall formed by wall studs 12 and a wall sheet 11. Wall studs 12 each have a side face 13 into which screws 119 are fastened after passing through fastener holes 118. Wall sheet 11 is cut to have edges 14 which ideally smoothly follow the outer circumference of walls 114, 115, 116, 117, but in reality may fail to do so and define a gap 15. Lip 150 extends beyond the outer circumference of walls 114, 115, 116, 117 to cover gap 15 and display a finished appearance to an observer.

The space saving provided by bottle rack 100 is provided by the storage of at least a portion of bottle rack 100 and/or bottles 10 between side faces 13 of wall studs 12 and edges 14 of wall sheet 11 in interior chamber 105. Although the entirety of bottle rack 100 and/or bottles 10 need not be stored between side faces 13 and edges 14, the storage of even a small portion between side faces 13 and/or edges 14 increases the volume available in a room bounded by wall sheet 11.

Bottle rack 100 may be dimensioned in particular for the storage of wine bottles as follows. For example, rods 121, 122 may be separated on center by a distance D1 that is less than the diameter of common wine bottles but large enough to support common wine bottles without fear of the bottles rolling out of cradles 120. For example, distance D1 may be greater than about 2 cm or greater than about 5 cm. Distance D1 may also be less than 13 cm, or less than 10 cm. Housing 110 may have a depth D2 that determines the size of the longitudinal slice of common wine bottles stored between side faces 13 and/or edges 14. Depth D2 may be greater than 1 cm, or greater than 3 cm, or greater than 5 cm. Housing 110 has a width D3. Width D3 may be adjusted in accordance with local building codes and the dimensions and materials of wall studs 12 to substantially traverse the entire distance between side faces 13. For example, in many areas in the United States, on center spacing between adjacent 2x4 wood studs is typically 16 inches (almost 41 cm) or 24 inches (almost 61 cm). In this case, width D3 may be about 37 cm or about 57 cm.

Referring to FIGS. 3 and 4, a bottle rack 200 houses bottle cradles 220. Bottle cradles 220 are generally solid, shelf-like extensions between side walls 116, 117 and include an upward facing concavity 222 for supporting bottles 10 with their corks or other stoppers in contact with a stored liquid, for example, with a stored wine. A similar concavity (not shown) is formed in bottom wall 115 for supporting bottle 10A. Since bottle cradles 220 are solid, bottle rack 200 is mechanically robust.

Referring to FIG. 5, another bottle cradle 320 includes a first cantilevered arm 321, a second cantilevered arm 322, a first arcuate portion 324, and a second arcuate portion 325. In housing 110, first cantilevered arm 321 is mounted to side wall 117 and supports first arcuate portion 324 in an upturned orientation. Likewise, second cantilevered arm 322 is mounted to side wall 116 and supports second arcuate portion 325 in an upturned orientation at a position slightly below arcuate portion 324.

Referring to FIG. 6, a bottle rack 300 additionally includes a covering door 360 vertically hinged by hinges 363 to housing 110. Housing 110 includes a magnetic latch 366 that mates with a complementary member (not shown) on the rear side of door 360 for releasably retaining door 360 in the closed position. Door 360 includes a handle 362 that allows an operator to release door 360 from latch 366 and access interior chamber 105 to add or remove bottles 10. Door 360 may be made from a translucent or opaque material to limit or prevent exposure of bottles 10 in bottle rack 300 to light.

Referring to FIGS. 7-10, a bottle rack 400 provides temperature-controlled storage of wine. Bottle rack 400 includes a heat exchange plate 410 that defines a meandering conduit 423 extending between an inlet fitting 421 and an outlet fitting 422. Heat exchange plate 410 is mounted flush with rear wall 112 of housing 110 and is in thermal contact with bottle cradles 220. Bottle cradles 220 are made from metal to place cradled bottles (not shown) in thermal communication with conduit 423.

Bottle rack 400 also includes an insulating strip 430 positioned between door 350 and lip 150 to thermally insulate the interior of bottle rack 400. Housing 110 and door 360 are also relatively thicker than in other implementations and made from a thermally insulating material like wood or polymer. Alternatively, housing 110 and door 360 may be covered by an additional thermal insulation layer to minimize heat loss. Lip 150 includes a standoff spacer 152 that moves door 360 into the room and away from wall sheet 11 to accommodate the space occupied by heat exchange plate 410 and a thicker rear wall 112.

Referring in particular to FIG. 7, in use, conduit 423 through bottle rack 400 is added to a fluid flow path of cool water. A water supply pipe 20 conducts cool water in the direction of arrow A to a service pipe 24 beneath a floor 16. Pipe 21 conducts cool water from supply pipe 20 through floor 16 and up to inlet fitting 421, where the water enters conduit 423 and exchanges heat with heat exchange plate 410 to cool bottle rack 400. The water exits bottle rack 400 at outlet fitting 422 and flows to service pipe 24 through a pipe 23. Provided that interior chamber 105 is sufficiently thermally insulated, interior chamber 105 of bottle rack 400 is cooled below room temperature to improve storage of wine.

A number of implementations have been described. Nevertheless, it will be understood that various modifications may be made. For example, a wide variety of wine cradles may be used. Other heat exchange mechanisms including thermoelectric coolers and

forced air systems may readily be used to provide temperature-controlled storage of wine. Covering door 360 may be horizontally hinged or replaced by another covering mechanism such as a flexible sheet loaded on a spring-loaded roller. Covering door 360 may include decorative coverings to make the bottle rack aesthetically pleasing. Wall sheet 11 may be wallboard, paneling, backer board, plaster, masonry, or any other material that forms a wall.

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Accordingly, other embodiments are within the scope of the following claims.

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